

Abstract

5 A method for sputtering a thin film protective layer that allows the protective layer (overcoat) to be ultra-thin with improved durability over prior art films is disclosed. The method reduces kinetic energy of the ions of the overcoat material during the initial period of deposition to form a buffering interface which reduces the interpenetration of the atoms of the protective layer into the
10 underlying film. In the method of the invention the sputtering of the overcoat preferably begins with zero (or very low) voltage applied to the underlying film resulting in minimal ion implantation in the underlying film. The "high energy" phase of the process begins with increases in the magnitude of the negative bias voltage applied to the underlying film. The higher energy imparted to ions in the
15 plasma result in a denser and harder film being formed over the initial buffer layer. The protective layer preferably comprises carbon and nitrogen. The protective layer structure of the invention is preferably used over a magnetic layer on thin film magnetic media.